

IGNITE AMPS

engineering for the moshpit

PTEq-X

AUDIO PLUG-IN

USER MANUAL

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Introduction

PTEq-X is a digital emulation of 3 famous vintage passive equalizers. It has been developed to have all the characteristics of the original hardware, plus some circuit improvements and additional features to increase its versatility.

Every single component on the signal path of the real analog circuit has been taken into account and modeled in the best possible way to match the original sound, keeping an eye on CPU performance and real-time playability at the same time.

PTEq-X is meant to be used as a studio equalizer for tracking, mixing and mastering inside hosts capable of VST, VST3 or AU Plug-Ins support.

Minimum System requirements

Windows:

Windows 7/8/10 (32/64 bit)
Intel Pentium 4 or AMD Athlon XP

Mac:

OSX 10.7
Intel processor with SSE2 instructions support

Installation

To install the PTEq-X Plug-In, just follow the instructions below, according to the platform and plug-in format you want to use.

Windows VST:

Copy the file **PTEq-X.dll** into your VST Plug-Ins folder.
(for example C:\Program Files\Steinberg\VSTPlugins)

Windows VST3:

Copy the file **PTEq-X.vst3** into your VST3 Plug-Ins folder.
(for example C:\Program Files\Steinberg\VST3)

Mac OSX VST:

Copy the bundle **PTEq-X.vst** into the path: /Library/Audio/Plug-Ins/VST/

Mac OSX VST3:

Copy the bundle **PTEq-X.vst3** into the path: /Library/Audio/Plug-Ins/VST3/

Mac OSX AU:

Copy the bundle **PTEq-X.component** into the path: /Library/Audio/Plug-Ins/Components/

For the Windows VST/VST3 format, we provide separate x86 (32 bit) and x64 (64 bit) binaries, so make sure to choose the right one according to your operating system and plug-in host specifications.

Keep in mind that x64 binaries will not run on 32 bit environments, while x86 binaries will most likely run on 64 bit environments, although we do not recommend such usage for performance and stability reasons.

We strongly advice Windows users against putting both the x86 and x64 versions in the host VST/VST3 folder(s), as this may cause one of the versions not to be recognized as a plug-in.

Mac OSX plug-ins (VST/VST3/AU) are compiled in Universal Binary format for Intel processors, containing both 32 bit and 64 bit code in the same bundle, which means that the user doesn't need to care about choosing x86 or x64 version, as the system will handle that automatically.

After that, you should (re)start your favourite VST/VST3/AU host, making sure it re-scans your Plug-Ins folder(s) to recognize the PTEq-X as a new "Effect" Plug-In (please note that some hosts may not re-scan the plug-in folder automatically at every start-up, so you may need to do it manually. Refer to your host's

manual for instructions).

If everything is right, you should now see the PTEq-X entry into the “Effects” Plug-Ins list of your host.

Main Features

- Three different equalization modules with perfectly analog curve response even at highest frequencies
- Ignite Amps 3rd generation triode stage analog modeling for 4 different tube types
- Additional selectable frequencies for the PEQ1A model, compared to the original design
- Refined filters frequency precision for the MQ5 and H3C models, compared to the original design
- Switchable equalizers and tube stage modeling for better CPU usage management
- Switchable linear phase oversampling for aliasing reduction
- Global input / output level controls
- Mono / Stereo processing support
- Double precision (64 bit) floating point mathematical models
- Automation support for all controls
- Ignite Amps proprietary preset management system with bank file import/export functions

Graphic User Interface



Fig. 1 – PTEq-X Graphic User Interface

As you can see from the screenshot (fig.1), we've decided to make the PTEq-X look as similar as possible to the real hardware it emulates, in order to make the user experience easier, giving the chance to tweak the controls of the plug-in like one would do like one would do when having a parametric equalizer in front.

The GUI is composed by a **header**, containing the Presets Management System plus other convenient functions, the **main view**, containing the equalizers controls and a **footer**, placed at the bottom of the interface, containing the global controls of the plug-in.

Main View Controls



Fig. 2 – PTEq-X Main View

In the main view (fig. 2) of the PTEq-X you'll find the 3 rack equalizers controls:

MQ5 Mid Range Equalizer controls

- [1] **Power:** lets you switch the equalization module On (up) and Off (down).
- [2] **Low Peak Frequency Selector:** a 5 positions rotary switch that controls the center frequency of the Low Peak Boost [3] control. The original circuit has been modified to improve the peak frequency precision, while retaining the characteristic gain/bandwidth interaction.
- [3] **Low Peak Boost:** controls the amount of gain applied to the low frequencies. The circuit is configured as a boost-only peak filter. You can select the frequency range with the Low Peak Frequency Selector [2]. When set to zero, no boost will be applied.
- [4] **Mid Dip Frequency Selector:** a 11 positions rotary switch that controls the center frequency of the Mid Dip Attenuation [5] control. The original circuit has been modified to improve the dip frequency precision, while retaining the characteristic gain/bandwidth interaction.
- [5] **Mid Dip Attenuation:** controls the amount of attenuation applied to the mid frequencies. The circuit is configured as a dip filter. You can select the frequency range with the Mid Dip Frequency Selector [4]. When set to zero, no attenuation will be applied.
- [6] **High Peak Frequency Selector:** a 5 positions rotary switch that controls the center frequency of the High Peak Boost [7] control. The original circuit has been modified to improve the peak frequency precision, while retaining the characteristic gain/bandwidth interaction.
- [7] **High Peak Boost:** controls the amount of gain applied to the high frequencies. The circuit is configured as a boost-only peak filter. You can select the frequency range with the High Peak Frequency Selector [6]. When set to zero, no boost will be applied.

PEQ1A Program Equalizer controls

- [8] **Power:** lets you switch the equalization module on (up) and off (down).
It is worth noting that the PEQ1A status (enabled/disabled) is completely independent from the Triode Gain Stage status, even if they are part of the same circuit, so you can have the tube switched On and processing your tracks even if the equalization module is switched off.
- [9] **Low Frequency Boost:** controls the amount of gain applied to the low frequencies. The circuit is configured as a low shelving filter. You can select the frequency range with the Low Frequencies Selector [10]. When set to zero, no boost will be applied.
- [10] **Low Frequency Selector:** a 6 positions rotary switch that controls the center frequency of the Low Frequency Boost [9] and Low Frequency Attenuation [11] controls. It features all the original design frequencies, plus some additional ones to increase its versatility.
- [11] **Low Frequency Attenuation:** controls the amount of cut applied to the low frequencies. The circuit is configured as a low shelving filter. You can select the cut frequency with the Low Frequency Selector [10]. When set to zero, no audible cut will be applied.
- [12] **High Frequency Bandwidth:** controls the bandwidth (or “Quality” factor) of the High Frequency Boost [13]. Turning it anti-clockwise (Sharp) will result in a sharper “bell”, turning it clockwise (Broad) will increase the “bell” size.
- [13] **High Frequency Boost:** controls the amount of gain applied to the high frequencies. The circuit is configured as a peak filter. You can select the peak frequency with the High Frequency Boost Selector [14] and you can tweak the peak bandwidth (or “Quality factor”) with the High Frequency Bandwidth [12] control. When set to zero, no boost will be applied.
- [14] **High Frequency Boost Selector:** a 8 positions rotary switch that controls the peak frequency of the High Frequency Boost [13] control. It features all the frequencies available on the original design.
- [15] **High Frequency Attenuation:** controls the amount of cut applied to the high frequencies. The circuit is configured as a high shelving filter. You can select the cut frequency with the High Frequency Attenuation Selector [16]. When set to zero, no audible cut will be applied.
- [16] **High Frequency Attenuation Selector:** a 6 positions rotary switch that controls the center frequency of the High Frequency Attenuation [15] control. It features all the original design frequencies, plus some additional ones to increase its versatility.

Tube gain stage controls

- [17] **Power:** lets you switch the tube gain stage on (up) and off (down).
When switched off, the tube circuit will be completely bypassed, saving a good amount of CPU. The tube simulation algorithm is advanced and accurate to the point of being on-par (or even better in some cases) to the ones found in the most used electronic CAD software, but with real-time processing capability.
It delivers extremely realistic and detailed dynamic response. Even if it is not meant to saturate by design, it will still add even and odd order harmonics, making you tracks instantly sound more rich, lively and pleasant. You can use the Input Level Control [20] to drive the tube buffer harder. The tube is what makes these kind of vintage equalizers so special, so we suggest you to keep it enabled, especially when rendering your tracks.
It is worth noting that the tube gain stage status (enabled/disabled) is completely independent from the PEQ1A status, even if they are part of the same circuit, so you can have the tube switched On and processing your tracks even if the equalizer module is switched off.
- [18] **Tube Type Selector:** lets you choose one of the 4 available tube types. Clicking on this control will make a drop down menu appear and you will be able to select your preferred

tube model. We suggest you to listen carefully to understand the harmonic difference between each one.

When the Tube Gain Stage is switched Off, this control will be greyed out.

HL3C Filter controls

- [19] **Power:** lets you switch the equalization module On (up) and Off (down).
- [20] **High Pass Frequency Selector:** a 11 positions rotary switch that controls the cut-off frequency of the Low Pass Filter. The original circuit has been modified to improve the cut-off frequency (-3dB point) precision.
- [21] **Low Pass Frequency Selector:** a 11 positions rotary switch that controls the cut-off frequency of the High Pass Filter. The original circuit has been modified to improve the cut-off frequency (-3dB point) precision.

Footer Controls



Fig. 3 – PTEq-X Footer

In the PTEq-X footer section (fig. 3), you'll find controls to manage the plug-in to suit your system and mixing environment at best:

- [1] **Input level:** lets you control the amount of signal going through the virtual circuit. The gain excursion of this control goes from -18db to +18db (the actual value is shown when the control is clicked).
The default value (knob at half) is 0db, or unity gain. It is very important to note that this control acts before the tube gain stage, so you can use it to drive the tube harder in order to achieve more harmonic distortion to enrich your tracks.
- [2] **Oversampling:** lets you choose the internal processing sample rate of the plug-in. The available options are **2x**, or **OFF**. This means that if your host is set up to process at 44100Hz sample rate, by selecting 2x oversampling, the PTEq-X will process the input signal at $44100 \times 2 = 88200$ samples per second. Oversampling is needed to avoid digital artifacts (aliasing) and to improve the accuracy and musicality of the plug-in. Obviously, the higher the oversampling, the higher the CPU usage.
PTEq-X uses linear-phase oversampling algorithms to avoid phase issues when using the plug-in on a Send channel and reports the additional latency to the host for correct compensation.
Keep in mind that the sound difference between the 2 modes is not going to be night and day, so, for tracking/mixing/mastering purpose, you will hardly need to rework the settings when switching between different oversampling values. A good practice would be to run the plug-in without oversampling during tracking/mixing/mastering to achieve zero latency processing and low CPU usage and then switching it to 2x right before rendering your project.
- [3] **Routing:** lets the user select the processing mode of the plug-in (Mono or Stereo). It is extremely important to note that **when the triode is active**, a complete stereo separation, and thus a correct stereo image preservation, is only possible when the PTEq-X is placed on a stereo bus and fed with a stereo signal with left and right components panned at 100%. Feeding the PTEq-X with two tracks panned at less than 100% left and right, will not preserve the correct stereo separation of the tracks at the output.
Stereo Mode will approximately double the CPU load of the plug-in, as the two audio

channels are being internally processed by two separated instances of the PTEq-X.

- [4] **Output:** lets you control the amount of signal coming out of the plug-in. The gain excursion of this control goes from -18db to +18db. The default value (knob at half) is 0db, or unity gain. It is very important to note that this control acts after the digital circuit, so it is completely transparent to the harmonic content of the output. Having the same excursion of the Input Level control, you can easily use it to compensate for the eventual input boost/cut, in order to keep the output level constant.

Header controls



Fig. 4 – PTEq-X Header

In the PTEq-X header section (fig. 4), you'll find controls for the Ignite Amps proprietary Preset Management System and other useful features:

- [1] **Bank:** lets you change the name of the current bank. A bank is a group of presets which can be imported or exported to file, in order to save or recall settings and eventually share them with other PTEq-X users, or just move them from one DAW to another. Clicking on this control, will enable text editing, so just type in the new name and hit Enter to update.
- [2] **Load:** lets you load a previously saved bank (using the Save [3] control) from a file. Clicking on this button will open your OS file manager to select the desired bank file. Once the file is chosen, all the presets contained in the bank will be available on the Preset Selector [4] and the first one will be automatically loaded.
Please note that when loading a new bank, all the previous bank settings will be discarded, unless you saved them on a file.
- [3] **Save:** lets you save the current bank on file. Clicking on this button will open your OS file manager to select the path and the name of the file in which the bank will be stored. Once the file is chosen, all the presets contained in the current bank will be saved on the selected storage device and made available for future loading via the Load [2] control.
This is the only control that persists bank data on disk. Any other function of the Preset Management System will act on the plug-in memory, so no changes will be saved on file unless you use this control explicitly.
- [4] **Preset Selector:** lets you switch between presets contained in the current bank. Clicking on this control will open a popup menu showing all the available presets. Selecting a preset will immediately update the plug-in settings to the ones stored into it. Additionally, when the mouse cursor is over this control, a button labeled “E” (as “Edit”) will appear on the right side: by clicking on it you can edit the name of the current preset through a dialog box. Once a preset is loaded, as soon as you edit one of the plug-ins settings, an **asterisk** (“*”) will appear next to the preset name, in order to remind you that the settings for that preset are changed. You can revert the settings back using the Revert [7] function or permanently update them using the Store [8] function.
- [5] **Add Preset:** lets you add a new preset to the current bank. Clicking on this button will create and load a new preset with a default name (“Preset <N>”), using the current plug-in settings. You can change the preset name by moving the mouse cursor over the Preset Selector [4] and clicking on the “E” button which will appear on the right side of it.
- [6] **Remove Preset:** lets you remove a preset from the current bank. Clicking on this button will

erase the current preset and load the settings of the previous one on the list (or the next one, in case the removed preset was the first of the bank).

There is no undo function, so use this control carefully.

- [7] **Revert:** lets you revert the selected preset settings to the original state. Clicking on this button will discard all the current plug-in settings and reload the last saved ones. This control is enabled only when a preset has been changed from its saved state.

- [8] **Store:** lets you store the selected preset settings as its original state. Clicking on this button will save all the current plug-in settings and mark them as the last saved state, meaning that every successive use of the Revert [7] function, will recall these settings. This control is enabled only when a preset has been changed from its original state and will be disabled as soon as you click it (you'll also notice the asterisk next to the preset name disappear).

- [9] **Copy:** lets you copy the current preset settings on the plug-in's clipboard. You can then use the Paste [10] function to reload them. The cool thing about this control, is that the plug-in's clipboard is shared among different PTEq-X instances, so you can conveniently copy and paste settings from one to another, without having to explicitly save and load the bank.
Please note that as soon as all the instances of PTEq-X are removed from the project, the clipboard data will be lost.

- [10] **Paste:** lets you load the preset settings available on the plug-in's clipboard. You can then use the Copy [9] function to store them. The cool thing about this control, is that the plug-in's clipboard is shared among different PTEq-X instances, so you can conveniently copy and paste settings from one to another, without having to explicitly save and load the bank.
Please note that as soon as all the instances of PTEq-X are removed from the project, the clipboard data will be lost.

- [11] **About:** clicking on this button will show up all the PTEq-X additional information. Just click on whichever area of the plug-in graphic interface to make it disappear.

About output level and phase

In order to improve the user experience and let the user compare different settings with ease, PTEq-X features **automatic output level scaling**.

This means that when enabling/disabling the equalization modules or the tube gain stage, the output level will be kept constant, allowing extremely accurate A/B comparisons.

Additionally, **the output signal will always be kept in phase** with the input signal, avoiding potential phase cancellation issues when using the plug-in on a Send channel, or annoying output “pops” during parameter changes.

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Thanks to You too, for downloading and trying the PTEq-X plug-in and for reading the f***ing manual! :-)

Sincerely
The Ignite Amps Crew

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